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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
HO, CHUONG T	
ART UNIT	**PAPER NUMBER**
2664	

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/827,999	ANDREWS ET AL.	
	Examiner	Art Unit	
	Chuong Ho	2664	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 8-12* is/are rejected.

7)☐ Claim(s) *4-7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Claims 1-12 are pending.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1, 3, 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over McKeown et al. (U.S.Patent No. 5,923,644) in view of McKeown (U.S.Patent No. 5,500,858).

In the claim 1, see figures 8, 9, 10, McKeown et al. (U.S.Patent No. 5,923,644) discloses a system for scheduling arriving data packets for input to a switch. Having a plurality of input channels (input ports), and a plurality of output channels (output ports), scheduling being performed in successive scheduling phases, the system comprising the steps of prior to a first scheduling iteration of each scheduling phase: receiving at each of plurality of input channels data packets destined for transmission to one of plurality of output channels and wherein each of plurality of input and output channels are classified as unmatched prior to first scheduling iteration (see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57);
Storing received data packets into at least one data scheduling envelopt (Q_1...Q_N) associated with each of plurality of input channels, at least one data scheduling envelope being configured to store a plurality of data packets (see figure 1, see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57);

Assigning a channel pair weight to unmatched input-unmatched output channel pairs having a data scheduling envelope storing at least one data packets destined for transmission (see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57);

Sending a match request from each unmatched input channel to an unmatched output channel having a highest channel pair weight there-between (see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57);

Accepting a match request at each unmatched output channel from an unmatched input channel whose assigned channel pair weight there-between is determine to be highest from among all received match requests (see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57).

However, McKeown et al. (U.S.Patent No. 5,923,644)is silent to disclosing in each at least log N scheduling iterations of each scheduling phase.

McKeown (U.S.Patent No. 5,500,858) discloses in each at least log N scheduling iterations of each scheduling phase (see col. 2, lines 38-41, first it can shown that each iteration will match or eliminate on average at least ¾ of the remaining possible connections and thus the algorithm will converge to a maximal matching in O(log N) iterations, see col. 7, lines 62-67) .

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of McKeown (U.S.Patent No. 5,923,644) with the teaching of McKeown (U.S.Patent No. 5,500,858) to provide in each at least log N scheduling iterations of each scheduling phase in order to converge to a good match

after several iterations. Therefore, the combined system would have bee enable the maximum weight matching algorithm.

2. In the claim 3, see figures 8, 9, 10, McKeown et al. (U.S.Patent No. 5,923,644) discloses a system for scheduling arriving data packets for input to a switch. Having a plurality of input channels (input ports), and a plurality of output channels (output ports), scheduling being performed in successive scheduling phases, the system comprising the steps of prior to a first scheduling iteration of each scheduling phase: receiving at each of plurality of input channels data packets destined for transmission to one of plurality of output channels and storing at least one received data packets in an ith channel data scheduling envelope associated with a virtual output queue, wherein a first scheduling envelope at virtual output queue is a head-of-line data scheduling envelope and a first stored data packet in head-of-line data scheduling envelope is a head-of-line (HOL) packet; (see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57);

Assigning a channel pair weight to unmatched input-unmatched output channel pairs having a data scheduling envelope storing at least one data packets destined for transmission (see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57);

Sending a match request from each unmatched input channel to an unmatched output channel having a highest channel pair weight there-between (see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57);

Determining at each of unmatched output channel a highest assigned weight from among all received input channel match request; and granting at each of unmatched output channels a match request to an input channel whose determined assigned weight there-between is highest (see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57).

However, McKeown et al. (U.S.Patent No. 5,923,644)is silent to disclosing in each at least log N scheduling iterations of each scheduling phase.

McKeown (U.S.Patent No. 5,500,858) discloses in each at least log N scheduling iterations of each scheduling phase (see col. 2, lines 38-41, first it can shown that each iteration will match or eliminate on average at least ¾ of the remaining possible connections and thus the algorithm will converge to a maximal matching in O(log N) iterations, see col. 7, lines 62-67) .

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of McKeown (U.S.Patent No. 5,923,644) with the teaching of McKeown (U.S.Patent No. 5,500,858) to provide in each at least log N scheduling iterations of each scheduling phase in order to converge to a good match after several iterations. Therefore, the combined system would have bee enable the maximum weight matching algorithm.

3. In the claim 8, see figures 8, 9, 10, McKeown et al. (U.S.Patent No. 5,923,644) discloses a system for scheduling arriving data packets for input to a switch. Having a plurality of input channels (input ports), and a plurality of output channels (output ports), scheduling being performed in successive scheduling phases, the system comprising

the steps of prior to a first scheduling iteration of each scheduling phase: receiving at each of plurality of input channels data packets destined for transmission to one of plurality of output channels and wherein each of plurality of input and output channels are classified as unmatched prior to first scheduling iteration (see col. 6, lines 47-52, col. 7, lines 9-12; lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57);

Storing received data packets into at least one data scheduling envelopt (Q_1...Q_N) associated with each of plurality of input channels, at least one data scheduling envelope being configured to store a plurality of data packets (see figure 1, see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57);

Assigning a channel pair weight to unmatched input-unmatched output channel pairs having a data scheduling envelope storing at least one data packets destined for transmission (see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57);

Sending a match request from each unmatched input channel to an unmatched output channel having a highest channel pair weight there-between (see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57);

Accepting a match request at each unmatched output channel from an unmatched input channel whose assigned channel pair weight there-between is determine to be highest from among all received match requests (see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57).

However, McKeown et al. (U.S.Patent No. 5,923,644)is silent to disclosing in each at least log N scheduling iterations of each scheduling phase.

McKeown (U.S.Patent No. 5,500,858) discloses in each at least log N scheduling iterations of each scheduling phase (see col. 2, lines 38-41, first it can shown that each iteration will match or eliminate on average at least ¾ of the remaining possible connections and thus the algorithm will converge to a maximal matching in O(log N) iterations, see col. 7, lines 62-67) .

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of McKeown (U.S.Patent No. 5,923,644) with the teaching of McKeown (U.S.Patent No. 5,500,858) to provide in each at least log N scheduling iterations of each scheduling phase in order to converge to a good match after several iterations. Therefore, the combined system would have bee enable the maximum weight matching algorithm.

4. In the claim 9, McKeown (5,923,644) discloses with output channel, for matching an input-output channel pair wherein the input-output channel pair has the highest assigned weight, there-between (see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57).

5. In the claim 10, Mckeown (5,500,858) discloses associated with each virtual output queue, for determining a total number of bytes comprising stored data packets arriving at the associated virtual output queue; and associated with each virtual output queue; and associated with each virtual output queue, for determining a delay associated with head-of-line (HOL) packet (see col. 7, lines 44-50, col. 10, lines 47-52).

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combined system (McKeown (5,923644) – Mckeown (5,500,858)) in view of Charny et al. (U.S.Patent No. 6,072,772).

In the claim 2, McKeown (5,500,858) discloses determining a number of bytes to be transmitted there-between (see figure 2, col. 7, lines 44-50); determining a delay value associated with a received data packets (see col. 10, lines 47-52); computing an assigned channel pair weight as a linear combination of determined numbers of bytes and determined delay (see col. 7, lines 44-50, col. 10, lines 47-52).

However, the combined system (McKeown (5,923644) – Mckeown (5,500,858)) is silent to disclosing determining a delay value associated with a received data packet having a highest time-stamp to be transmitted there-between.

Charny et al. discloses determining a delay value associated with a received data packet having a highest time-stamp to be transmitted there-between (see col. 13, lines 20-40).

Thus, it would have been obvious to one ordinary skill in the art at the time of the invention to modify the combined system (McKeown (5,923644) – Mckeown (5,500,858)) with the teaching of Charny to determining a delay value associated with a received data packet having a highest time-stamp to be transmitted there-between in order to provide deterministic delay and bandwidth guarantees while utilizing the scalability of a crossbar switch with speedup.

7. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over McKeown et al. (U.S.Patent No. 5,923,644) in view of Chao et al. (U.S.Patent No. 6,667,984).

In the claim 11, see figures 8, 9, 10, McKeown et al. (U.S.Patent No. 5,923,644) discloses a system for scheduling arriving data packets for input to a switch. Having a plurality of input channels (input ports), and a plurality of output channels (output ports), scheduling being performed in successive scheduling phases, the system comprising the steps of prior to a first scheduling iteration of each scheduling phase: a comparator (arbiter 90) connected to simultaneously receive weight elements in successive clock cycle iterations, comparator configure to output a largest weight element from among the received weight element in each clock cycle iteration (see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57, col. 10, lines 5-9);

A demultiplexer (92) configured to receive largest weight element from comparator (90), demultiplexer further configured to distribute largest weight elements to output lines (see figure 1, see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57);

However, McKeown et al. (U.S.Patent No. 5,923,644)is silent to disclosing a plurality of comparators each configured to receive the largest weight elements from a corresponding output line of output lines, each plurality of output comparators being further configured to output a largest weight element from among received weight elements.

Chao (U.S.Patent No. 6,667,984) discloses a plurality of comparators (output arbiters) each configured to receive the largest weight elements from a corresponding output line of output lines, each plurality of output comparators being further configured to output a largest weight element from among received weight elements.

, see figure 11, col. 16, lines 30-33) .

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of McKeown (U.S.Patent No. 5,923,644) with the teaching of Chao (U.S.Patent No. 6,667,984) to provide a plurality of comparators each configured to receive the largest weight elements from a corresponding output line of output lines, each plurality of output comparators being further configured to output a largest weight element from among received weight elements in order to converge to a good match after several iterations. Therefore, the combined system would have bee enable the maximum weight matching algorithm.

8. In the claim 12, see figures 8, 9, 10, McKeown et al. (U.S.Patent No. 5,923,644) discloses a system for scheduling arriving data packets for input to a switch. Having a plurality of input channels (input ports), and a plurality of output channels (output ports), scheduling being performed in successive scheduling phases, the system comprising the steps of prior to a first scheduling iteration of each scheduling phase: a comparator (arbiter 90) connected to simultaneously receive weight elements in successive clock cycle iterations, comparator configure to output a largest weight element from among the received weight element in each clock cycle iteration (see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57, col. 10, lines 5-9);

A demultiplexer (92) configured to receive largest weight element from comparator (90), demultiplexer further configured to distribute largest weight elements to output lines (see figure 1, see col. 6, lines 47-52, col. 7, lines 9-12, lines 25-28, lines 58-63, col. 8, lines 25-27, lines 49-57);

However, McKeown et al. (U.S.Patent No. 5,923,644)is silent to disclosing a plurality of comparators each configured to receive the largest weight elements from a corresponding output line of output lines, each plurality of output comparators being further configured to output a largest weight element from among received weight elements.

Chao (U.S.Patent No. 6,667,984) discloses a plurality of comparators (output arbiters) each configured to receive the largest weight elements from a corresponding output line of output lines, each plurality of output comparators being further configured to output a largest weight element from among received weight elements.

, see figure 11, col. 16, lines 30-33) .

Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of McKeown (U.S.Patent No. 5,923,644) with the teaching of Chao (U.S.Patent No. 6,667,984) to provide a plurality of comparators each configured to receive the largest weight elements from a corresponding output line of output lines, each plurality of output comparators being further configured to output a largest weight element from among received weight elements in order to converge to a good match after several iterations. Therefore, the combined system would have bee enable the maximum weight matching algorithm.

Allowable Subject Matter

9. Claims 4-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuong ho whose telephone number is (571)272-3133. The examiner can normally be reached on Monday-Friday from 8:00AM-4:00PM.

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

11/25/04